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The IOWA COOPERATOR

U.S. DEPT. OF AGRICULTURE
SOIL CONSERVATION SERVICE

F E B R U A R Y, 1 9 3 7

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2,000 EROSION CONTROL DEMONSTRATION FARMS IN IOWA

At the beginning of 1937, a total of 341,512 acres of Iowa farm land was under cooperative agreement with the Soil Conservation Service.

The 2,169 farmers who are cooperating with the Service bear a large responsibility for the success of erosion control work in Iowa. Their farms are the demonstration centers of soil conservation, and the type of work done there will greatly influence the interest and conservation activities of thousands of farmers in the future. It is essential, therefore, that we put forth our best efforts to continue a well-balanced program of erosion control in 1937.

Since the first Soil Conservation Service demonstration project in Iowa was established at Shenandoah in February 1934, treatment for erosion control has been completed on 139,003 acres of farm land in camp and project areas, and the remainder under contract is being worked as rapidly as possible. Among the principal methods of treatment are included improvement of crop rotations, contour farming, strip cropping, terracing, pasture improvement, tree planting, and gully control. Allied with the treatment of land for erosion control is the program of wildlife conservation sponsored by the Soil Conservation Service, whereby patches not suited for cultivation are planted to food and cover plants for game birds and animals.

Crop rotations have been improved by including erosion-control-living legumes or grasses in the cropping plan on 141,914 acres. Cooperators have agreed to farm 31,557 acres on the contour and to strip crop 7,400 acres.

The improvement of crop rotations and other cropping changes have resulted in a reduction of cultivated crops by approximately 20,000 acres and a resultant increase in erosion-resisting crops amounting to about 22,000 acres.

The terracing program of the Service on farms of cooperators has given protection against erosion on 6,878 acres of crop land through the construction of 460 miles of broad base terraces. A total of 1,645 temporary and permanent structures was built in the 294,804 feet of channel necessary to provide outlets for run-off from the terraces. Gully control work consisted principally of building 22,787 temporary dams. 1,416 permanent dams and sloping of 3,166,691 square yards (approximately 654 acres) of gully banks for seeding, sodding, or planting to trees.

Most of the 5,000,000 trees planted in 1936 on cooperating farms in Iowa were planted on gully banks or other badly eroded areas. The total area planted to date amounts to 2,233 acres. In addition, improved woodland management practices have been adopted on 4,726 acres of timber. Plantings of trees, shrubs, and other food and cover plants have totaled approximately 692 acres, most of which has been trees and shrubs. The 14 acres of food plots were made up of 46 small patches.

Throughout the administration of the Soil Conservation Service program in Iowa, it has been the purpose of the Service to help provide a balanced system of erosion control for each demonstration farm that will be most satisfactory for the future welfare of the farmer. Cooperators have given splendid support in the past, and their continued cooperation will be a major factor in promoting the program to conserve the soil and save the farms of Iowa in the future.

ENROLLEES ON THE JOB

Snows and low temperatures do not stop all the field work by CCC enrollees in Iowa's Soil Conservation Service camps. In fact they provide an opportunity to catch up on certain types of work in preparation for the rush spring and summer seasons.

Quarrying and crushing of agricultural limestone to be used on cooperators' farms for growing legumes is one of the main winter camp jobs. More than 59,000 tons of limestone have been quarried by the camps since they came under the supervision of the Soil Conservation Service in April 1935. Preparation of limestone in late fall and winter months makes it possible for farmers to haul and spread it on their fields at a time when farm work usually is slack.

Another winter job for enrollees is woodland improvement activities. It consists of cutting dead and diseased trees, thinning, and other cutting to improve established stands of timber. Also, a great deal of work is done in building fences to keep livestock away from timber land or newly planted areas. Demonstrations of proper woodland management practices are held during the winter to encourage farmers who own timber land to make their stands most productive. More than 200 of these demonstrations have been held in camp areas of the state.

Emergency feeding of wildlife in winter also is among the activities of enrollees. CCC camps cooperate with state and local agencies in providing food and shelter for many kinds of wildlife. The Iowa Conservation Commission and local agencies have supplied large quantities of feed for CCC camps to distribute when snow or ice causes a scarcity in natural foods for wildlife.

Farmers and CCC enrollees are operating 904 winter feeding stations in the state. Emergency feeding is being done only until such time as sufficient permanent plantings are made to provide ample food and cover throughout the year.

THE FORESTRY PROGRAM

ENGLISH CREEK AREA

MARION COUNTY

Knoxville, Iowa--The project comprises a 31,500-acre watershed and six camps. The camps are located in the county seat towns of Marion, Lucas, Appanoose, Wapella, Jefferson, and Keokuk Counties.

Due to the topography and soil types prevalent within the project, forestry plays an important part in many of our cooperative agreements. The forestry demonstrations entail woodland improvement cutting, the reforestation of badly sheet-eroded fields and waste land and the planting of "raw" gullies to trees.

The Knoxville project has a variable topography. On the divides between the rivers, creeks, and large drainageways, the land is level or gently rolling. On the slopes leading to the water courses, the land is rolling to very steep. In some sections of the project, the level and gently rolling areas are quite large; in other sections the divides are very small and cut up by the large drainageways.

The level and gently rolling land has good soil and is adapted for general farming. The steeply rolling land, when cultivated, is subject to severe erosion and is better adapted for the grazing of livestock. The very steep land is usually of an inferior soil type that will not retain its topsoil under grazing and, therefore, should be left in woodland or reforested.

In order to keep the woodland areas for the continuous production of timber, the woodlands should not be grazed or any section clear cut when the timber crop is harvested. Cattle browsing and tramping kill all the young trees and brush needed to hold the annual leaf fall on the area. The accumulation of leaves makes the floor of the woodland

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IOWA SOIL CONSERVATION ASSOCIATIONS

The county soil conservation association is the key group in the county in the direction of erosion control activities within the respective counties. Eighteen associations have been organized within the state during the last two years.

The beginning of association activities dates back to the establishment of the first 4-county soils committee in the winter of 1929 and 1930. At that time the counties of Appanoose, Monroe, Mahaska, and Wapello each organized a county committee to cooperate with the other counties in employing a soils and erosion specialist. Representatives of each county then formed the 4-county committee, outlined a program and with the cooperation of the Extension Service of Iowa State College employed a full-time worker to establish demonstrations and conduct educational work.

A year later the counties of Decatur, Wayne, Lucas, and Marion formed another group and initiated an intensive soils and erosion control program in the counties. In the organization and support of this work the county farm bureau provided the leadership.

The establishment of CCC camps for erosion control brought up another problem of local interest and leadership. Appanoose County again set the pace and in 1934 organized a soils association. Since then, 17 other associations have been formed with an average of 150 members. Most of the associations are organized with articles of incorporation and bylaws. They have the regular officers. Most of them have an initial membership fee of one or two dollars.

The directors meet at frequent intervals with the CCC camp superintendents and the county agents. The principal activity has been the crushing and distribution of limestone. Many other important activities, such as securing members and cooperators and providing terracing equipment by the association, have been very helpful in locating soil conservation demonstrations in local areas. Many association officers and members have been doing considerable educational work on local demonstrations.

Another 4-county soils project was started in the spring of 1930 in Tama, Benton, Iowa, and Poweshiek Counties. Here the county unit is a part of the county farm bureau and the county program a part of the county extension educational program.

--W. F. Watkins, Extension Associate Professor of Agronomy

WILDLIFE MANAGEMENT IN EROSION CONTROL

TARKIO RIVER AREA

MONTGOMERY AND PAGE COUNTIES

Shenandoah, Iowa--The present program in soil conservation is to combine all practical methods of control into a balanced system of correct land use. These measures are used in accordance with the needs and adaptability of the land requiring treatment. A complete land use program should provide for wildlife. The routine erosion control practices cannot but help to benefit farm game to some extent. Our first efforts must be toward rebuilding the habitats essential to the existence of wildlife. This consists primarily in the restoration of food and cover plants in proper relation to one another. In this we come to the basic principle of erosion control, the maximum use of vegetation.

Objectives in our wildlife program might be the betterment of conditions for wildlife, the avoidance of practices which would be detrimental, and the development of an annual self-perpetuating crop of game on lands retired from agricultural use in the interest of erosion control.

Southwest Iowa is lacking in cover. A limited amount of game cover planting has been done and more is planned for the future planting seasons in conjunction with gully planting. Last winter each camp operated some emergency feeding stations. This year shelter and feeders were being prepared before adverse conditions arose in both project and camp areas. Coveys of quail were located whenever possible through the aid of farmers, sportsmen, 4-H club boys, and local conservation officers. Feeding stations were then erected by the above parties or by our Service. Local newspapers, the College, and the State Conservation Commission have cooperated in article and bulletin preparation.

Winter is always a critical period for game birds. Insufficient cover and lack of food, greatly accentuated by the drought conditions of last summer, will make artificial feeding a necessity. Winter feeding to be most successful must be based on systematically established plans. Well-fed birds rarely die from exposure.

By using small waste areas for food and cover patches, erosion will be checked in such areas by the vegetation, and wildlife will be given food and shelter. More food and cover areas will reduce the need for emergency winter feeding.

--Robert E. Lee, Acting Wildlife Technician

SOIL CONSERVATION SURVEYS

FARMERSBURG-MCGREGOR AREA

CLAYTON COUNTY

McGregor, Iowa--The Farmersburg-McGregor demonstration project of approximately 13,000 acres is located in northeast Iowa in Clayton County. The soils of the area are developed from a relatively thick mantle of loessial, or wind-blown, material.

Tama silt loam occupies approximately 60 percent of the area. Prairie conditions where a temperate climate, smooth land surface, and a moderately plentiful supply of moisture have favored the growth of a luxuriant grass vegetation rather than the spread of forests have given this area a dark-colored topsoil averaging from ten to twelve inches in depth. The fertility is relatively high, and texture, structure, and physical make-up are such that its capacity for absorbing water and its ability to withstand erosion are above the average. This soil type does not gully easily.

The balance of the project area is occupied by soil types which were formed under forest conditions from wind-blown parent material. These soils have a lighter-colored topsoil, are subject to more severe erosion, gully easily, and are much lower in natural fertility.

Methods to be used in any attempt at soil conservation and erosion control obviously must be based upon a knowledge of soil conditions such as natural fertility, soil acidity, crop adaptation, the amount of topsoil remaining to be saved and used, the degree of slope, the ability of the topsoil and subsoil to withstand erosion, the texture and structure of the soil, all of which may have a bearing upon its ability to absorb and hold water.

The plan of land utilization, therefore, depends upon an appraisal of soil conditions which is presented in outline form by the soil erosion inventory map.

The physical inventory of each farm is presented in the composite soil erosion survey map. The area of each soil type is delineated on the outline map of the farm. The degree of slope for each part of the farm is shown by groups as follows:

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|--------------|---|
| 0 to 3% | - Little erosion control necessary |
| 3 to 12% | - Erosion is active but with effective control measures clean-tilled crops may be used with minimum soil losses |
| 12 to 16% | - Should not be used for clean-tilled crops; legumes, hay crops, and pasture advisable |
| 16% and over | - Slopes too steep to permit effective erosion control if in cultivation. |

The erosion for each area of the farm is delineated into five phases ranging from 1+, continuous deposition of soil, to 4, which means that over 75% of the topsoil has been removed by erosion. The "slope groups" indicate the potential danger of erosion losses while the "erosion phases" give the actual loss already incurred.

--D. E. Perfect, Asst. Conservation Surveyor

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act as a sponge. The leaf mold holds more moisture on the surface for the surface roots of the trees and helps more water percolate into the soil. The growing trees need the moisture caught by the leaf mold for good growth. Dead tops in the trees are the first indication of an overgrazed woodland. The leaf mold also gives the yearly tree seed crop a chance to sprout and grow. Clear cutting exposes large areas to the drying action of the sun, making conditions adverse for desirable trees to rehabilitate the area.

The woodland improvement areas show the cooperators how a large supply of wood can be cut on a given area and yet leave the area in good growing condition for the remaining trees and their reproduction.

The planting of trees on eroded and waste land, although requiring several years for returns, makes profitable use of land too poor to produce any other crops. Black locust would give the cooperator the quickest returns, but large areas usually are not planted to one kind of tree because of the danger of an insect infestation or disease wiping out the entire plantation. Other kinds of trees are planted with the black locust, the choice of trees depending upon the conditions of the area.

The gully planting consists of willows in the gully bottom and black locust on the banks. Bordering the locust, other trees are planted to the fence which encloses the gully planting area. An effort is made to give the cooperator the kind of trees he would like to have planted. The oak, walnut, and hickory are seed planted on the area. Other trees used as one-year stock are green ash, red elm, hackberry, and osage orange.

Forestry plays an important role in the future land use of the Knoxville project. Woodland areas properly managed will give a yearly income in products such as posts, piling, and sawlogs; the reforestation of sheet-eroded land, waste land, and "raw" gullies will net returns in the future. Through reforestation, much soil will be held in place, and many scars will be healed by a protective cover of trees and shrubs.

--Harold Boeger, Forestry Technician

EROSION CONTROL ENGINEERING

INDIAN CREEK PROJECT

LINN COUNTY

Marion, Iowa--The Indian Creek watershed was selected as a demonstration project by the Soil Conservation Service in order that methods of soil and water conservation might be introduced and practiced on lands that still retained a major portion of the topsoil and where gullying is not the main type of erosion.

The topography of the area is best described as being flat to rolling with slopes varying from 1 to 10 percent. Slopes in waterways are slight as is indicated by the fact that there is less than 200 feet difference in elevation between the upper lip of the watershed and the outlet of the area approximately 10 miles downstream.

The only gullies occurring in the area are found in drainageways having comparatively large drainage areas. The cause of gullying can be charged to unprotected tile outlets or to bulkheads without suitable provisions for carrying surface run-off. Such gullies are rare and never deeper than 4 to 5 feet. All structures built in this area will serve as tile outlets with weir notches capable of handling surface run-off from storms with a frequency of once in 50 years.

Terracing is the principal engineering method of controlling soil and water loss in this areas. Since slopes are gentle, a large part of the area is suitable to terracing. Although the slopes are gentle, much variation occurs in distance between terraces, causing some difficulty in farming with the terraces, due to the point rows involved. Construction of terraces with wide flat channels and broad bases is easily accomplished on these gentle slopes.

The terrace outlet problem has caused the most trouble in this area. Many fields that should be terraced, and could otherwise be terraced, are without a suitable outlet. It would either be necessary to cross a farm boundary or the outlet would be too long to be practicable. However, since the slopes are gentle and soils are such that vegetation grows abundantly, outlets can be protected by preparation and seeding a season in advance of the terraces. In no case has it been necessary to use structures to protect terrace outlets.

--Richard A. Wilcox, Asst. Engineer

About 1,900 winter feeding stations are being operated in CCC camp and demonstrational project areas under the supervision of the Soil Conservation Service to protect game birds and animals in those areas of the state where natural food is scarce. Numerous food and cover patches are being established each year where they will control erosion and furnish food and cover for wildlife.

THE AGRONOMY PROGRAM

GRAND RIVER WATERSHED

ADAIR COUNTY

Greenfield, Iowa--More than 100 cooperators have agreed to follow a balanced crop rotation of a type that will decrease soil losses, increase rainfall absorption, and build fertility, as a part of the agronomy program on their farms.

Several thousand tons of lime have been used to sweeten sour soil and bring about vigorous growth of soil-building legumes. Where the soil does not contain sufficient available phosphates for good plant growth, phosphate has been added in a demonstrational way.

Contour farming was practiced on several farms the past year, a couple contouring all tilled fields. In 1937, one or more fields of corn on most of the farms will be contoured to demonstrate the resultant saving of soil, rainfall, lime, and fertility, which otherwise would run off readily from straight downhill rows.

Grassed waterways are being established to prevent further hill-side gullyng. These waterways, instead of gradually becoming waste ditches, will thus produce good hay or pasture, as well as prevent gullyng.

Narrow buffer strips, which are permanent bands of hay crops winding on the contour around hills, are being established to catch and hold soil on the thinner band of many hills. These buffers will act later as guidelines for contour planting of the fields when in corn. Also, some of the buffers will become a line for field divisions to effect later contour strip cropping of those hillsides.

Other agronomy practices adopted include the use of winter cover crops of rye or wheat on otherwise bare and washy corn land. Several cooperators will practice control-grazing of pastures.

--Carl R. Fritzsche, Associate Agronomist

2,000,000 TONS OF SOIL SPREAD OVER IOWA

It is estimated that almost 2,000,000 tons of fine soil was deposited over Iowa by the recent storm which blanketed the snow with silt. Measurements made at Ames showed that about 107 pounds of soil was deposited on each acre in that section of the state, and on the Soil Conservation Service demonstration area at Shenandoah silt deposits amounted to 274 pounds per acre. Experiments reveal that rainfall run-off will carry away as much as 30 tons of soil per acre annually from sloping land planted to corn continuously.

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